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# Pericardial/Myocardial Disease/Pulmonary Hypertension

## 3D RECONSTRUCTION OF THE RIGHT VENTRICLE FROM 2D ECHOCARDIOGRAPHIC IMAGES IN PULMONARY ARTERIAL HYPERTENSION: VALIDATION AGAINST CMR

Poster Contributions
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**Background:** Right ventricular (RV) volume and function assessments are essential in management of pulmonary arterial hypertension. Three-dimensional (3D) echocardiography is limited by acoustic dropout of the RV free wall in dilated ventricles. We hypothesized that a novel method for 3D reconstruction of RV endocardium from 2D echocardiographic images could provide accurate measurements of RV volumes.

**Methods:** 27 patients with pulmonary arterial hypertension (26 female) were prospectively recruited for same-day echocardiography and cardiac magnetic resonance (CMR), which was used as a reference. 2D echocardiographic images were acquired with a 3D spatial localization device to allow 3D reconstruction. Anatomic landmark selection on 2D images and 3D reconstruction were performed with dedicated software (Ventripoint) to obtain end-diastolic and end-systolic volumes (EDV, ESV). The method of disks was used to determine RV volumes on CMR. Inter- and intra-observer variability was assessed in 15 patients using coefficients of variation.

**Results:** Echocardiographic RV volumes correlated well with CMR (EDV, r=0.87; ESV, r=0.88). Inter-observer variability was: EDV, 9±8%; ESV, 10±9%, and RVEF, 11±8%. Intra-observer variability was: EDV, 9±6%; ESV, 11±8%; and RVEF, 11±9%.

**Conclusion:** This new 3D reconstruction technique provides accurate and reproducible measurements of RV volumes in pulmonary arterial hypertension patients, in whom volumetric measurements are difficult.